REMARKS

Applicants request favorable reconsideration and allowance of this application in view of the foregoing amendments and the following remarks.

Claims 1, 2, 5, 8, 10, 11, and 19 are pending in this application, with Claims 1, 10, and 19 being independent.

Claims 1, 10, and 19 have been amended. Applicants submit that support for the amendments can be found, for example, at least in the description of the neighborhood region determining step 108 discussed page 9, line 25 through page 10, line 7 of the specification (paragraph [0062] of the published application). Accordingly, Applicants submit that no new matter has been added.

Claims 1, 2, 5, 8, 10, 11 and 19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,859,921 to Suzuki, in view of U.S. Patent No. 5,008,946 to Ando. Applicants respectfully traverse this rejection for the reasons discussed below.

As recited in independent Claim 1, the present invention includes, *inter alia*, the features of analyzing an input image to get an unverified candidate eye area, determining a neighborhood region based on the unverified candidate eye area, the neighborhood region being defined as a rectangle, the center of which is the center of the unverified candidate eye area and the size of which depends on the image. A determination of whether or not the unverified candidate eye area is a true eye area is made by comparing the ratio of N/S (where N is the number of dark areas in the neighborhood region and S is the size of the neighborhood region) to a predetermined threshold.

According to the above-mentioned features of Claim 1, the present invention makes the determination of whether an unverified candidate eye area is a true eye area based not on a

characteristic of the candidate eye area but rather on a neighborhood region of the candidate eye area. Thus, since a neighborhood region of a true eye contains many dark areas (for example, an eyebrow area and an eyelash area), the present invention utilizes the neighborhood region to determine if a candidate eye area is a true eye area.

Applicants submit that the cited art fails to disclose or suggest at least the above-mentioned feature of determining a neighborhood region based on an unverified candidate eye area, the neighborhood region being defined as a rectangle, the center of which is the center of the unverified candidate eye area and the size of which depends on the image. Instead, Suzuki and Ando disclose to gradually narrow down an area to obtain an eye area.

In particular, Suzuki shows, in Fig. 6, for example, that an eye area including the eyebrow and eyelash is first detected from a centroid of an X axis histogram and a centroid of a Y axis histogram. After that, as shown in Fig. 7, for example, a candidate eye area is detected from the X axis histogram and the Y axis histogram. Finally, as shown in Fig. 8, for example, an evaluation value is calculated from the width of the candidate eye area and a maximum value of a histogram to determine the eye area.

Accordingly, Suzuki discloses that a candidate eye area is detected based on histograms, using the processing described with respect to Figs. 6 and 7, and then an eye area is determined by the processing of Fig. 8. However, the processing of Fig. 8 does not involve determining a neighborhood region based on the candidate eye area, the neighborhood region being a defined as a rectangle, the center of which is the center of the candidate eye area and the size of which depends on the image. To the contrary, the processing of Fig. 8 simply uses the width of the candidate eye area and a maximum value of a histogram. Accordingly, Applicants submit that

Suzuki does not disclose or suggest step c) recited in independent Claim 1. Nor, as conceded by the Examiner, does it disclose steps d)-f).

Applicants submits that Ando also fails to disclose or suggest at least the above-mentioned features of the present invention recited in Claim 1 and, even if combined with Suzuki, would not render obvious the invention of Claim 1. Ando discloses the feature of detecting a pupil from an area (see, e.g., Fig. 8c). By detecting continuous black images, the pupil is detected as shown in Fig. 13e. Ando also uses vertical and horizontal ratios of an eye area and a pupil area in order to determine whether or not a detected pupil area is a true pupil (see, e.g., Steps 135-137).

However, Applicants submit that Ando does not disclose or suggest the use of an area ratio (i.e., N/S) as recited in Claim 1. As shown in Fig. 13e of Ando, a black pixel block is evaluated, i.e., the dimensions of black regions are calculated and compared to dimensions of human eyes to determine if the black region is a pupil. In contrast, the present invention of Claim 1 evaluates an area as shown in Fig. 1 in which multiple black regions occur. Thus, the areas evaluated in Ando are different in nature from those evaluated in Claim 1 to determine a true eye area; Ando evaluates the size of black regions while the invention of Claim 1 evaluates a ration of the number of black regions within the neighborhood region to the size of the neighborhood region.

Accordingly, Applicants submit that Ando likewise fails to disclose or suggest step c) of the invention recited in Claim 1, as well as steps d)-f). Moreover, Applicants submit that even if the cited art is combined, there is nothing in the cited art that would lead one skilled in the art to combine the teachings in a way that would result in determining a neighborhood region as

recited in step c) of Claim 1, and then using the ratio of N/S in that neighborhood region to determine whether an unverified candidate eye area is a true eye area.

For the foregoing reasons, Applicants submit that the present invention recited in Claim 1 is patentable over the art of record.

The other independent claims recite features similar to those of Claim 1 discussed above, and are believed to be patentable for reasons similar to those discussed regarding Claim 1.

The dependent claims are believed patentable for at least the same reasons as the independent claims, as well as for the additional features they recite.

For the foregoing reasons, this application is believed to be in condition for allowance. Favorable reconsideration, withdrawal of the outstanding objections and rejections, and an early Notice of Allowance are requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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